

CLAIM AMENDMENTS

Please replace the pending claims with the following:

1. (Currently amended) An electrochemical device comprising a cathode, an anode and an electrolyte arranged between the cathode and anode, which electrolyte comprises an ionic liquid comprising an anion and a cation, which cation has a pyrrolidinium ring structure,

~~and~~ wherein the active material of the cathode comprises as its major constituent by mass an intercalation material having an upper reversible-potential-limit of at most 4 V versus Li/Li⁺ and comprising any of the following compounds: Li₄Ti₅O₁₂, LiTi₂O₄, Li_{4-y}Mg_yTi₅O₁₂ (0 ≤ y ≤ 1), V₂O₅, Li₄Mn₅O₁₂, Li_{4-y}Mg_yMn₅O₁₂ (0 ≤ y ≤ 1).

2. (Previously presented) The electrochemical device of claim 1, wherein the electrochemical element is a primary battery or a rechargeable battery or an electrochemical capacitor.

3. (Previously presented) The electrochemical device of claim 1, wherein the electrochemical element is configured for use at a temperature above 50 °C.

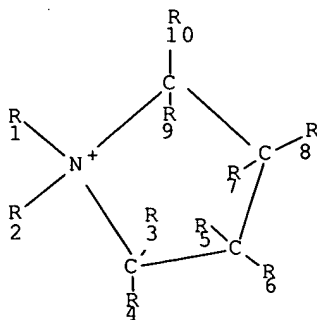
4. (Previously presented) The electrochemical device of claim 3, wherein the electrochemical element is configured for use at a temperature between 60 and 200 °C.

5. (Previously presented) The electrochemical device of claim 1, wherein the pyrrolidinium ring structure has the formula: *N*-R₁-*N*-R₂-pyrrolidinium, wherein R₁ and R₂ are alkyl groups.

6. (Previously presented) The electrochemical device of claim 5, wherein the pyrrolidinium ring structure has the formula *N*-methyl-*N*-butyl-pyrrolidinium.

7. (Withdrawn) The electrochemical element claim 5, wherein the pyrrolidinium ring structure has the formula *N*-methyl-*N*-hexyl-pyrrolidinium.

8. (Previously presented) The electrochemical device of claim 1, wherein the pyrrolidinium structure is:



wherein R₁-R₁₀ are either: H; F; separate alkyl groups which may be branched, substituted and comprise heteroatoms; separate phenyl groups which may be substituted and comprise heteroatoms.

9. (Previously presented) The electrochemical device of claim 1, wherein the anion of the ionic liquid comprises any of the following compounds:

ClO₄⁻, PF₆⁻, BF₄⁻, AsF₆⁻, a halogen ion, N(CF₃)₂⁻, N(CF₃SO₂)₂⁻, CF₃SO₃⁻, N(CH₃SO₂)₂⁻, N(C₂F₅SO₂)₂⁻, B(C₂O₄)₂⁻, C(CF₃SO₂)₃⁻.

10. (Previously presented) The electrochemical device of claim 1, wherein the electrolyte further comprises a salt.

11. (Previously presented) The electrochemical device of claim 10, wherein the salt comprises an alkali salt.

12. (Withdrawn) The electrochemical element of claim 10, wherein the salt comprises MgCF₃SO₂ or Mg(ClO₄)₂.

13. (Cancelled)

14. (Cancelled)

15. (Currently amended) An electrochemical device comprising a cathode, an anode and an electrolyte arranged between the cathode and anode, which electrolyte comprises an ionic liquid comprising an anion and a cation, which cation has a pyrrolidinium ring structure ~~The electrochemical device of claim 13,~~ wherein the cathode comprises LiCrTiO_4 as the major constituent by mass of the active material.

16. (Currently amended) An electrochemical device comprising a cathode, an anode and an electrolyte arranged between the cathode and anode, which electrolyte comprises an ionic liquid comprising an anion and a cation, which cation has a pyrrolidinium ring structure ~~The electrochemical device of claim 13,~~ wherein the cathode comprises TiS_2 as the major constituent by mass of the active material.

17. (Currently amended) An electrochemical device comprising a cathode, an anode and an electrolyte arranged between the cathode and anode, which electrolyte comprises an ionic liquid comprising an anion and a cation, which cation has a pyrrolidinium ring structure ~~The electrochemical device of claim 13,~~ wherein the cathode comprises $\text{Li}_{1-y}\text{M}_y\text{FePO}_4$, where $\text{M}=\text{Mg}, \text{Nb}, \text{Zr}, \text{Ti}, \text{Al}$ and $(0 \leq y \leq 0.02)$, as the major constituent by mass of the active material.

18. (Cancelled)

19. (Withdrawn) The electrochemical element of claim 1, wherein the anode comprises as the major constituent by mass of the active material any of the following compounds:

$\text{Li}_4\text{Ti}_5\text{O}_{12}$, LiCrTiO_4 , LiTi_2O_4 , $\text{Li}_{4-y}\text{Mg}_y\text{Ti}_5\text{O}_{12}$ ($0 \leq y \leq 1$).

20. (Withdrawn and amended) The electrochemical element of claim 1, ~~wherein the cathode comprises as the major constituent by mass of the active material $\text{Li}_{1-a}\text{FePO}_4$ ($0 \leq a \leq 1$) and~~ wherein the anode comprises as the major constituent by mass of the active material $\text{Li}_{(4-y)+b}\text{Mg}_y\text{Ti}_5\text{O}_{12}$ ($0 \leq b \leq 3$ and $(0 \leq y \leq 1)$).

21. (Cancelled)

22. (Withdrawn) The electrochemical element of claim 1, wherein the cathode or anode comprises polyvinylidene fluoride (PVDF) as a binder material.

23. (Withdrawn) The electrochemical element of claim 1, wherein the cathode or anode comprises polytetrafluoroethylene (PTFE) as a binder material.

24. (Withdrawn) A method of providing electrical energy in an underground wellbore, wherein the energy is provided by an electrochemical element according to claim 1.

25. (Withdrawn) The method of claim 24, wherein the wellbore forms part of an oil or gas production well or a geothermal well.

26. (Withdrawn) The method of claim 24, wherein the wellbore forms part of an oil or gas production well and oil or gas is produced through the well and wherein the flow of oil or gas is monitored and/or controlled by electric downhole monitoring or control equipment which is powered by an electrochemical element according to claim 1.